FLIGHT
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EDITORIAL COMMENT.

IN this week's issue of FLIGHT we publish an account of the St. Louis aviation meeting, and more particularly of the race for the Pulitzer Trophy. After digesting the facts one is left with a feeling of admiration for the enormous strides made by the United States in aviation during the last two years, or even during the last year. It is not so very long ago that it was the fashion in Europe to sneer at American aviation, and to regard every report of a new "record" established on the other side with scepticism, as being closely allied with "bluff." Whether or not that attitude was justified does not greatly matter. What does matter at the moment is that America has now unquestionably left behind her any fumbling and blundering that may in the past, rightly or wrongly, have been laid at her door, and has attained a position in the world's aeronautics second to none, at any rate so far as quality is concerned. We are saying this, not in a spirit of envy, but rather in one of admiration for the determination, backed by designing and engineering skill, which has enabled America in a few months, figuratively, not only to catch up but to overtake the rest of the world in several spheres of aviation activity, as the number of records now standing to the credit of American aviators testify.

The Pulitzer Race

It may be asked what is the real importance to a country of gathering in as many world's records as possible. The answer to this cannot be set down in a few words, but one thing is certain, the prestige of a country, and particularly of its aviation industry, is thereby vastly enhanced. Thus when a foreign country is intending to purchase machines abroad and is looking around for suitable types, it will inevitably turn first to a country which holds most of the world's records, be they for speed, altitude, distance or load carried. In other words, as M. Laurent Eynac, French Under-Secretary of State for Air, once so aptly said, world's records are the publicity of a nation's aircraft progress. But from that it naturally follows that achievements attaining such publicity should have the support of the Govern-

ment of the country, and that is precisely what the American Government has done during the last couple of years. There is here a lesson plain for all to read, and it is to be hoped that our Air Ministry will, sometime or other, be able to convince the Treasury of the truth of this contention. Then, and not, we fear, until then, will British aviation be in a position to show the world that if the financial assistance is forthcoming our constructors are capable of producing machines that will hold their own against those of any other country.

On the technical side the value of world's records is that they teach designers and constructors a vast amount of information and knowledge which cannot be obtained in any other way. This, in itself, is of incalculable value. But even the machines themselves are not as useless as some would claim who can see in them nothing but racing "freaks." If one looks through the history of the past it will be found to have been proved over and over again that the racing machine of today is the service machine of tomorrow—if not the actual machine as it stands, then a slightly modified version of it, possibly with slightly larger wings so as to get a better climb, greater carrying capacity and consequently longer range. Thus there does not appear to be any reason why the Curtiss-Navy racers of the Pulitzer race should not become, in some such manner, extremely useful service machines, and at the moment it is fairly safe to assume that no other country in the world possesses machines that could come within miles of the performance of these racers.

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Britain in America Next Year?

The success of the St. Louis meeting, following on the American win at Cowes in the Schneider Cup Race, naturally raises the question of British participation in the International events to be held in America in 1924. It is understood that a very generous suggestion has been made by America to British manufacturers if they will promise to send over machines for next year's competitions. While we fully appreciate the generous and friendly spirit in which this offer was made (and, incidentally, we believe that similar offers have been made to France), it does seem to us that to accept the offer would hardly be compatible with British dignity. America won the Schneider Cup through sheer technical excellence and good organisation. We cannot well—or, at least, that is how the matter appeals to us—accept American financial assistance to send machines over to try to win back the lost trophy. If we are to take part in races in America, we must do so entirely by our own efforts, otherwise the Cup, which is now one of the most coveted in the world, will lose its value. A thing gained "on the cheap" is rarely worth the gaining.

The proper—and incidentally, of course, the obvious—way of dealing with the problem would be for the Treasury to set aside, after close consultation with the Air Ministry, certain sums to be devoted to British participation in international aviation events abroad next year. Also certain sums or premiums for the best performances in attempts at world's records. In France M. Laurent Eynac has offered considerable sums to French firms who succeeded in bringing back to France some of the records lost to America. What is the result? Already Sadi Lecointe, on a Nieuport-Delage biplane, with Hispano-Suiza engine, has beaten the altitude record held by the American aviator Macready. With foreign governments supporting their constructors in this manner it is not to be wondered at that any private British attempts, no matter how meritorious individually, are almost foredoomed to failure. Will our Treasury be convinced and afford our constructors the backing required?

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What About Some Light 'Plane Records?

While waiting for the British Treasury to come forward with support for sporting aviation, private constructors might help themselves to a certain extent by trying for a few outstanding performances on light aeroplanes. It is true that at the moment no "records" are recognised for this type of machine, but any fine performance, either in distance, duration, or altitude, would be the finest possible advertisement for the firm that designed and built the machine, and what is most important at the moment it would cost very little. The altitudes attained at Lympne were astonishing, but they certainly did not represent the ceilings of the respective machines. In every case, we believe without exception, the pilots were prevented from going higher by their carburettors freezing up. With better provision for heating the induction pipes there seems to be good reason to believe that heights not far short of 20,000 ft. are attainable by light 'planes.

Then there is the question of duration. A very rough calculation quickly shows that the light 'plane is capable of carrying fuel for astonishingly long periods. It even appears likely that a light 'plane might be able to beat the existing world's record for duration, of a heavier-than-air machine of any type or power. The main factor would appear to be the human element. If a pilot is physically and mentally able to stand the strain of some 40 hours' continuous flying, there seems to be reason to think that the machine would carry the necessary fuel.

Distance covered non-stop is another "record" worth trying for. It might be incorporated with the duration flight, and in this connection it is of interest to refer to a scheme outlined in our Light 'Plane and Glider Notes. A British pilot seriously suggests the feasibility of crossing the Atlantic in a light 'plane. While we do not altogether share his optimism, we still think that the mere duration and distance called for to cross the Atlantic are within the capacity of a light aeroplane, but the risk would be unnecessarily great and the strain on the pilot terrific. A less spectacular, although technically quite as useful, performance could be carried out over land, without incurring the risks of an Atlantic crossing. The Avro "Baby," with Green engine, did the London-Turin flight non-stop, piloted by Hinkler. The London-Malta flight non-stop should be worth trying for. Who will be the first to make the attempt?

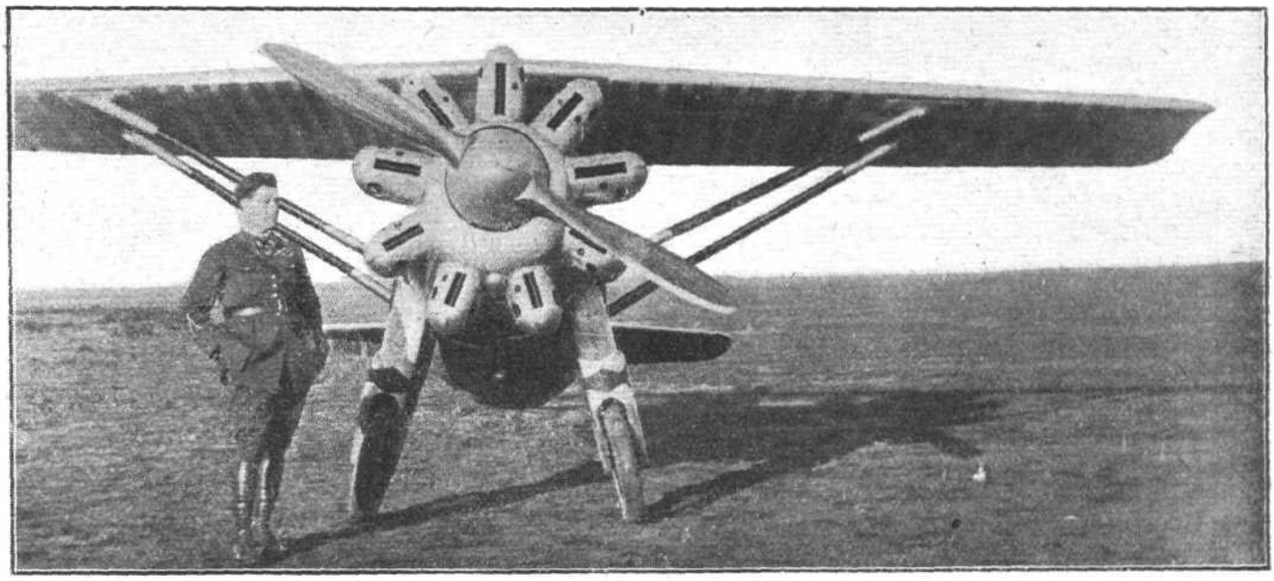
Again, although a flight around England at this time of the year is not inviting, it could probably be carried out, and would afford excellent publicity for the firm undertaking it. It might be arranged as a more or less leisurely tour, with stops and exhibition flights at the main centres. The Air Ministry is anxious to promote interest in flying, especially in connection with the new Territorial scheme. A small subsidy towards such a tour by light 'plane must result in quite a lot of good. But then, of course, that airworthiness certificate would have to be issued and that would be hurrying things far too much.

FLIGHT

A BRISTOL "JUPITER" MAKES HISTORY IN FRANCE

Over 223 m.p.h. in Gourdou-Leseurre Monoplane

THE radial air-cooled engine has had a hard fight to win recognition. To begin with, the critics said that it was very difficult to get air-cooled cylinders of large capacity to work satisfactorily. Perhaps it was, but at any rate there is no gainsaying the fact that by now such capacities have been designed, built, and successfully run for long periods.

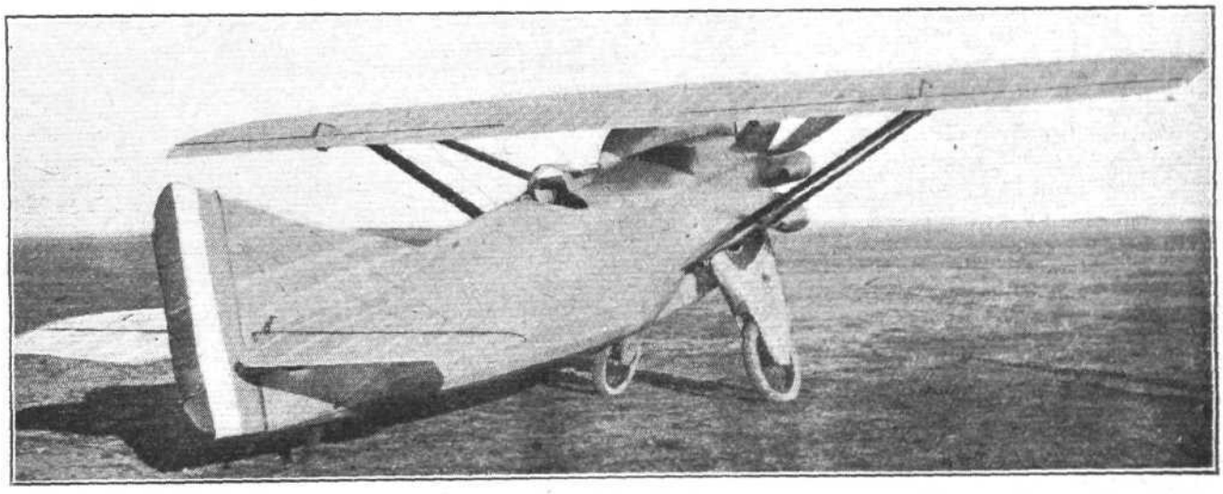


THE GOURDOU-LESEURRE MONOPLANE, BRISTOL "JUPITER" ENGINE: Note the streamline jackets around the cylinders. The undercarriage is of the retractable type.

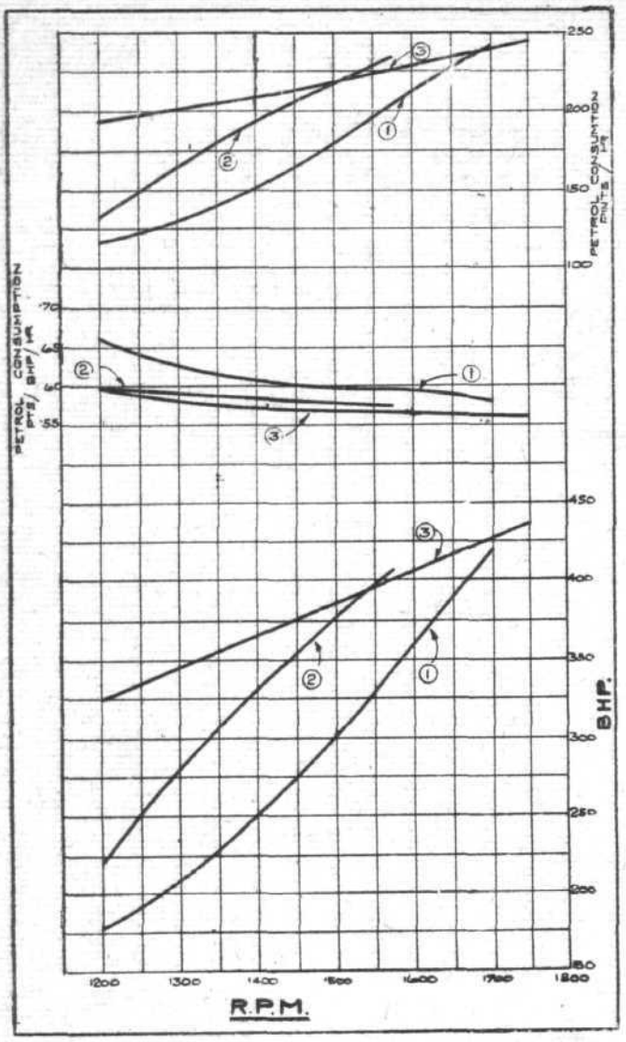
Secondly, while admitting that the short radial air-cooled engine might score on the question of weight and low moment of inertia for fighters, there has been a widespread impression that what was gained in weight was lost in head resistance, owing to the large fuselage necessary for streamlining an engine of such large overall diameter. The performance recently put up in France by the Gourdou-Leseurre monoplane seems to indicate that this criticism also can be met.

As already recorded in FLIGHT, the speed race for the Coupe Beaumont, which was to have been held at Istres, near Marseilles, was abandoned this year, the reason being that one of the French entrants was not allowed to fly in the race, and the second, the Gourdou-Leseurre monoplane, very sportingly being withdrawn rather than letting it cover the course and thus win the race whatever the speed attained. No foreign entries had been received. With the machine already at Istres, the opportunity was, however, taken to try it out over the Beaumont circuit of 50 km. (31 miles). The astonishing speed of 360 km. (223·7 m.p.h.) was attained, which is probaby a record for this distance and over a circular course. It will be remembered that the usual world's records are flown over a straight-line course, two laps in each direction, where consequently the speeds attained are considerably greater than over a circular course.

The Gourdou-Leseurre monoplane was designed as a single-seater fighter, and is built of metal throughout, mainly Duralumin, with fittings and highly-stressed parts of steel. The machine is of very clean design, as the accompanying photographs will show, and possesses several interesting features. The Bristol "Jupiter" engine with which it is fitted has been very carefully streamlined, not only with a crank-case cowling and a spinner over the propeller boss, but also as regards the cylinders themselves. These, it will be seen, have been provided with aluminium jackets of streamline section totally enclosing the cylinders. The jacket of each cylinder extends over the cylinder head, and the only openings are a narrow slot down the front, and a small outlet at the back, near the top of the jacket, and of course the holes



THE GOURDOU-LESEURRE MONOPLANE: Three-quarter rear view. The recess in the sides of the fuselage into which the chassis fits when folded can be seen in this view.



Power curves of a standard Bristol "Jupiter" Engine: In the above graph throttle curves 1 indicate readings taken with dynamometer set at 90 per cent. of the rated horse-power, *i.e.* 344 b.h.p. at 1,575 r.p.m. Curves 2 indicate readings taken with dynamometer set at full power at 1,575 (*i.e.* normal) r.p.m. Curves 3 are full throttle power curves.

for the short exhaust pipes. This arrangement has been chosen in preference to a very large fuselage, and the greater proportion of cylinder projecting has been more than made up for by streamlining each in the manner described. Thus the fuselage itself is not much larger than necessary to make it meet the circumference of the crank-case. The speeds attained seem to show that, contrary to general opinion, it is better, aerodynamically, to have a narrow body with nearly the whole of the streamlined cylinders projecting than to have a large body with the cylinder heads only, but un-streamlined, projecting. As far as can be ascertained no trouble with overheating was experienced.

Another unusual feature of the Gourdou-Leseurre monoplane is the retractable undercarriage. Each wheel is mounted on a fork enclosed in a streamline casing, and when the machine is in the air these forks are swung back in such a manner that they drop into a recess in the sides of the fuselage.

The principle upon which the retractable undercarriage gear works is very simple, and seems to have worked well in practice. Each of the wheel forks is carried on a pair of Vee struts, of which the front ones are hinged to the lower longeron of the fuselage. The rear struts are secured at their upper end to a guide in the recess in the side of the fuselage. A quadrant is mounted on and moves with the Vees of the undercarriage, and extends from the top of the rear strut, across the Vee, and projects slightly forward of the front strut, about two-thirds of its length down from the upper end. Engaging with the quadrant is a worm, operated from the pilot's seat. When this worm is rotated it raises the quadrant, and with it the wheel. The lower ends of the wheel forks work in slots in the Vee struts, and the upper end has a cross member resting against rubber cord shock absorbers carried on spools mounted on the front Vees and between fore and aft members across the Vee respectively. The travel obtained is not very great, but the tests carried out so far appear to have been entirely satisfactory. It might be argued that an undercarriage of this type will not be very strong under side loads. While that is probably true, it should be remembered that if a machine with such high landing speed lands with even a small amount of drift, it will probably turn over anyway, and no amount of undercarriage strength against lateral loads will prevent this. That the retractable chassis on the Gourdou-Leseurre does add materially to the speed is not to be doubted.

The original, or normal, machine has a wing area of 20 sq. m., and the speed attained with this wing was 300 km. (186·5 m.p.h.). It is estimated that the ceiling, with the service wing fitted, will be more than 9,000 m. (29,600 ft.), so that the Gourdou-Leseurre monoplane should, in addition to its rôle as a racer, be a very useful type for service purposes as a single-seater fighter. The view obtained is excellent, the machine guns can easily be installed, and, finally, the radial "Jupiter" engine gives a low longitudinal moment of inertia, so that the machine should be very manœuvrable.

As rigged for the Coupe Beaumont the Gourdou-Leseurre monoplane had an overall length of 7·2 m. (23 ft. 7 ins.) and a span of 7·8 m. (25 ft. 7 ins.). The wing area of the racing machine was only 12 sq. m. (130 sq. ft.), and the maximum speed must be in the neighbourhood of 240 m.p.h.

The weight of the machine is given as 935 kgs. (2,060 lbs.), composed as follows: Engine installation, 345 kgs. (760 lbs.); pilot and instruments, 100 kgs. (220 lbs.); fuel, 160 kgs. (350 lbs.); machine, 330 kgs. (725 lbs.). The wing loading is 15·86 lbs./sq. ft., and the power loading (on 450 h.p.) 4·58 lbs./h.p.

It might be mentioned that the engine speed was 1,650 r.p.m., which, on this particular engine, No. 855, was equal to a power of 450 b.h.p. This engine gave 490 h.p. at 1,875 r.p.m., so that when it has been thoroughly tuned and fitted with a suitable propeller to allow of its being run up to its full power a considerably improved performance should be obtained.

While on the subject of the Bristol "Jupiter" engine reference may be made to a series of power curves recently taken on a standard "Jupiter," series IV. These tests were carried out at a moment's notice, simply for purposes of record, and without any special preparation or tuning of any sort. In other words, the engine was one picked at random from stock. As will be seen from the accompanying curves, the tests were eminently satisfactory. At normal speed (1,575 r.p.m.) the power at full throttle is 400 h.p. and the consumption is 225 pints (28 gallons 1 pint) per hour, or ·562 pint/h.p./hour.

Sadi Gets Up to 11,000 Metres

NOT content with his previously established record of 10,741 metres, Sadi Lecointe has made a further attempt, this time reaching an altitude of 11,000 metres. This figure has not yet been homologated, but the sealed barographs have been submitted to the Institute of Arts et Metiers for examination and correction, and their report will probably be available in a few days. The machine used by Lecointe was a Nieuport-Delage, with Hispano-Suiza engine and Lamblin radiators.

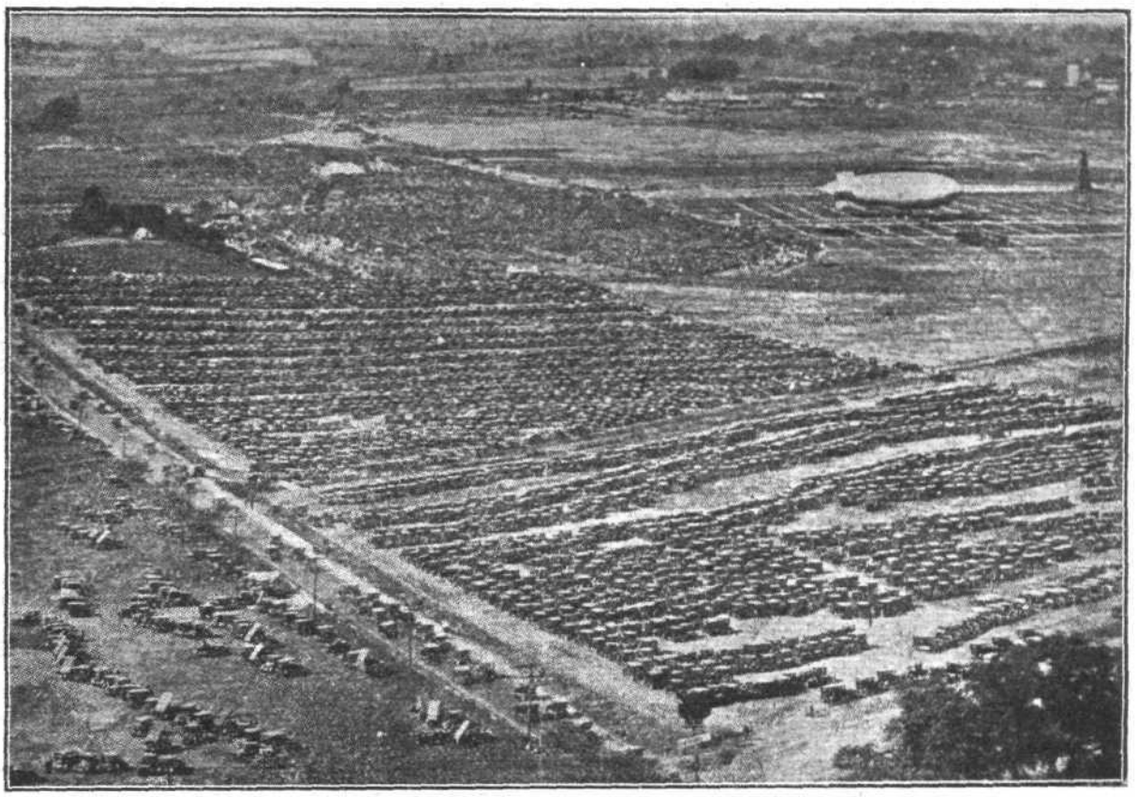
The Coupe Lamblin

BAD weather having interfered with the attempts made during the last days of October by several French pilots to beat the performance of Adjutant Bonnet in the Coupe Lamblin competition, which closed for this year on October 31, Bonnet remains the holder of the Cup for 1923. The circuit over which this competition was flown was Paris-Strassburg-Lyons, a distance of 1,200 km. (744 miles). Bonnet's time was 5 hr. 54 m. 13 s., giving an average speed of 195 km. (121 miles) per hour. Adjutant Bonnet receives a prize of 10,000 francs. Second in the race was Lieut. Bordes, whose time was 5 h. 58 m. 23·8 s. Lieut. Bordes receives a prize of 5,000 francs. Both flights were made on October 12, and have not been beaten by any later attempts. Curiously enough, third prize (3,000 francs) goes also to Adjutant Bonnet, for his flight on September 4, when his time for the circuit was 6 h. 14 m. 13 s. The machines used by both competitors were Nieuport-Delage biplanes, type 29, with 300 h.p. Hispano-Suiza engines, and are production types in actual use in the service. Needless to say, Lamblin radiators are used.

THE ST. LOUIS (U.S.A.) AIR RACE MEETING

DURING the first week in October last St. Louis held its annual International Air Race Meeting, the principal event of which being the speed contest for the Pulitzer Trophy. A full account of this meeting is given in a special issue of our American contemporary *Aviation*, from which it would appear that this year's meeting constituted one of the most successful and the biggest aviation events ever held in America—if not in the world. Space will not permit a full and detailed account being given in FLIGHT, but the importance of the St. Louis meeting warrants, we think, a resumé of the proceedings.

In addition to the Pulitzer Trophy six other events were flown during the three days of the meeting, October 4, 5 and 6 (bad weather necessitating a postponement from the original dates, October 1, 2 and 3). On the first two days of the meeting some 20,000-30,000 people attended on each occasion, whilst on the third day, when the Pulitzer race was run, the crowd was estimated at 100,000. Practically every type of aircraft was represented at St. Louis, from the huge Barling bomber down to the small Farman Sport 'plane. The machines present included observation 'planes such as the various D.H. types, Curtiss 18T, Lepère, Vought, Fokker C.O.4, McCook Field C.O.5 (Fokker type), X.B.1A, etc. Bombers: Douglas and Martin. Pursuit 'planes: Army

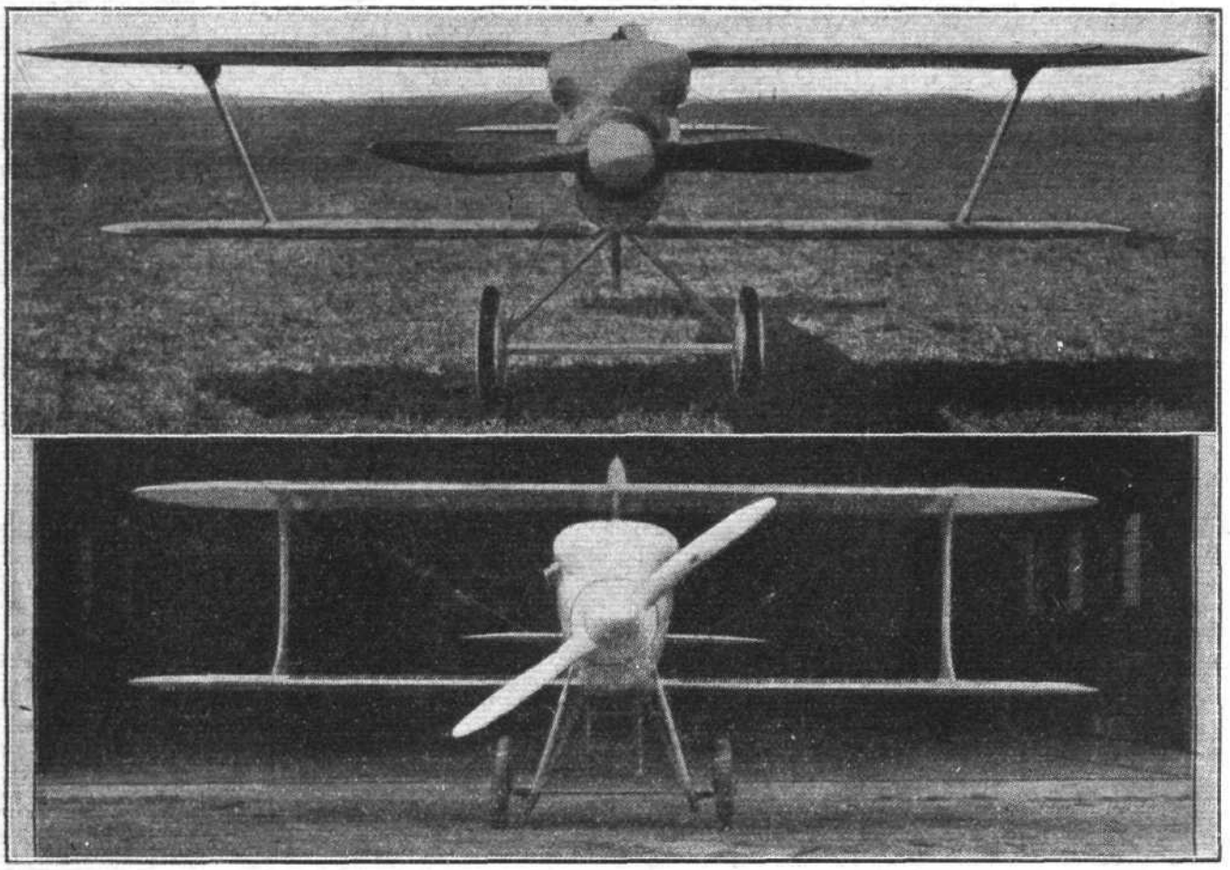


THE ST. LOUIS INTERNATIONAL AIR MEETING: A part of the crowd of 100,000 who saw the Pulitzer Race, as seen from the air. Note the airship on the right.

The St. Louis International Air Meeting: Another view of one of the Navy Wrights, two of which finished third and fourth respectively in the Pulitzer Race.

Fokker, Thomas Morse M.B.3. Amongst the civilians were Curtiss Oriole, Huff-Daland, Bellanca C.F., Laird Swallow, Messenger, Lincoln-Standard, Waco, Breguet, Hartzell-Johnson, Robertson, etc. Flying boats, both naval and civilian, were moored on the Mississippi River, and airships, both rigid and non-rigid, were represented in the Z.R.1, R.N.1 and T.C.3. Model aeroplanes, for which there was a special competition, also flew—in fact, the only absentees were free and captive balloons, helicopters and gliders!

As it was the "star" turn, we propose dealing with the Pulitzer race first. This event was flown over four laps of a triangular course of 50 kms.—a total distance of 200 kms., or 124·27 miles. It was won by Lieut. A. J. Williams, U.S.N., on a Navy Curtiss (500 h.p. Curtiss D.12), his average speed being 243·67 m.p.h. U.S. Navy pilots also captured the next three places, Lieut. H. J. Brow on the sister Navy-Curtiss being second, Lieuts. L. H. Sanderson and S. W. Callaway, both on Navy Wrights, third and fourth. Lieuts. W. Miller and J. D. Corkill, of the Army Air Service, on



A STUDY IN "FRONTS" FROM THE ST. LOUIS INTERNATIONAL AIR MEETING: At the top is the Curtiss Navy Racer, with a Curtiss 500 h.p. D.12 engine, which won the Pulitzer Trophy. Below, the Navy Wright with a 700 h.p. Wright T.3 engine. A side view, together with characteristics, of the Navy Curtiss appeared in "Flight" for October 18 last.

last year's Pulitzer Curtiss racers, were fifth and sixth respectively. The third Army entry, Lieut. A. Pearson on a Verville-Sperry (Curtiss D.12), was forced out in the first lap by an unbalanced propeller.

Coming now to the story of the Pulitzer race itself, this was held under perfect weather conditions. To reduce as far as possible the chance of accident, it was decided to pair the contestants and run the race in heats. Lieut. Sanderson was first in the air on Navy Wright No. 8. He circled the field beyond the starting-point and, after climbing to 4,000 ft., made for the first pylon, flashing past the timers at 2.31 p.m. A moment later Lieut. Corkill started on the 1922 Army Curtiss racer, and from 3,000 ft. dived for the pylon, turning it so closely that at first there were doubts as to the legality of his start.

In less than eight minutes Sanderson appeared on the home circuit, his time for the first lap being just over 30 mins. (230·33 m.p.h.). Corkill flew a trifle off course and made 210 m.p.h. for his first lap. Sanderson dropped to 229·83 m.p.h. on his second lap, but picked up to 229·99 on the third. Meanwhile Corkill was whirling around at 214-215 m.p.h., or an average of 216·45 for the race. Zooming after the finish, Sanderson climbed to 2,000 ft. before attempting a descent. When he was several hundred feet from the ground his machine was seen to dive straight for the ground and disappear behind an embankment. A minute or so later, however, he appeared on top of the embankment, waving his arms to show he was unhurt—much to everyone's relief.

He explained later that, after having circled twice to land, he thought other racers were taking off and that it might endanger them if he landed promptly. Coming toward the field to land, at about 1,500 ft., his petrol supply cut off, and seeing a tree and a haystack below, he chose the latter to absorb the shock of his high landing speed. The haystack saved "Sandy's" life, for while the machine was wrecked, he only suffered a sprained ankle and cut face and hands.

In the second heat Lieut. Williams with the blue Navy-Curtiss racer No. 9 was teamed with Lieut. Pearson in the grey Verville-Sperry racer entered by the Air Service.

Lieut. Williams took off with an engine bark such as had not often been heard before. After making a short circle, he dove straight for the starting line, passing over the timers' stand with the whining sound of a high-explosive shell. He made a fairly steep bank around the pylon and was off towards pylon No. 2.

In the meantime Lieut. Pearson in the slate-coloured Verville-Sperry entered by the Air Service was given the start. He had hardly reached the far end of the field after crossing the starting line when he noticed that the fuselage began to "weave," apparently because of an unbalanced propeller. As this deprived him of effective control in flight, he turned back into the field and effected a safe landing.

And now Williams was roaring over the timers' stand, which gave his speed for the first lap as 245·27 mi./hr.—a mark unprecedented in the annals of aviation—which beat Lieut. Maughan's fastest lap made in last year's race by almost 40 mi./hr.

When Pearson withdrew, the contest Committee decided to start the third and last heat with Williams still in the air.

Lieut. S. W. Callaway in the red Navy Wright racer No. 7 took off first, followed by Lieut. H. J. Brow in the blue Navy

Curtiss No. 10, and trailed by Lieut. W. Miller in the black Army Curtiss No. 49.

Shortly afterwards Williams finished the race in beautiful style, zooming as soon as he had cut the finishing line. His speed for the four laps (200 kms.) was 243·67 mi./hr. as against 205·9 mi./hr. for last year's race won by Lieut. Maughan.

It then remained to be seen whether Williams' time could be beaten by the three pilots entered in the last heat. It was not. Callaway averaged 230 mi./hr. for the race, coming within 0·06 mi. of Sanderson's mark; Brow came nearest to beating Williams by averaging 241·78 mi./hr., while Miller bettered the Army Air Service mark with 218·91 mi./hr.

Thus Lieut. Williams won the fourth Pulitzer Trophy at 243·67 mi./hr., Lieut. Brow finished second at 241·78 mi./hr., Lieut. Sanderson third at 230·06 mi./hr., Lieut. Callaway fourth at 230·00 mi./hr., Lieut. Miller fifth at 218·91 mi./hr. and Lieut. Corkill sixth at 216·45 mi./hr.

Turning now to the other events, the first of these was the Flying Club of St. Louis Trophy Race, flown on the morning of October 4. This was limited to machines of 90 h.p. or less, the course being three laps, or 150 kms. (93·21 miles). There were seven starters as follows:—R. P. Hewitt, Farman Sport (60 h.p. Anzani); C. S. Jones, Curtiss Oriole (90 h.p. Curtiss); Lawrence B. Sperry, Sperry Messenger (60 h.p. Lawrence); W. B. Robertson, Robertson Special (90 h.p. Curtiss); W. E. Lees, Hartzell F.C.1 (90 h.p. Curtiss); Perry Hutton, Laird Swallow (90 h.p. Curtiss); Tex La Grone, Rogers Day (90 h.p. Curtiss). W. E. Lees won this event with an average speed over the course of 89·51 m.p.h., and Perry G. Hutton captured second place with an average speed of 86·77 m.p.h. "Casey" Jones, on the Curtiss Oriole, was third with 85·28 m.p.h.

The second event scheduled for October 4 was a race for the John L. Mitchell Trophy, donated by Brig.-Gen. Mitchell and annually competed for by pilots of the First Persuit Group, flying standard machines. On this occasion the latter consisted of Thomas Morse M.B.3 'planes fitted with 300 h.p. Wright H.3 engines. This race was full of "snap" from start to finish, the six competitors starting at half-minute intervals and flying over four laps of the course (200 kms., or 124·27 miles). The six pilots were: 1st Lieuts. T. W. Blackburn, T. K. Matthews, G. P. Tourtellot, Capt. V. B. Dixon, 1st Lieut. J. T. Johnson and Capt. Burt E. Skeel. All rounded the first outlying pylon in the order given, but after this they began to change positions, and on the last lap a fierce struggle for first place ensued. Capt. Skeel, who started last, worked his way up to the front, and although he crossed the line behind Blackburn and Tourtellot, his average speed of 146·45 m.p.h. won him first place. Tourtellot ran out of petrol 300 ft. from the finishing line, and, diving, attempted to glide in. He could not extend his glide far enough, however, so he deliberately pancaked, and the resulting bump sent him across the line in flight a few feet over the ground, and thus obtained second place! Blackburn was third, and Johnson and Dixon were fourth and fifth respectively.

The final event on this day was the Liberty Engine Builders' Trophy race, which was open to regulation two-seater machines of the Army and Navy with a speed of more than 90 m.p.h. The course was over six laps (300 kms., or 186·42 miles). There were 13 starters, of which the Army represented 11. The machines were made up of a Curtiss 18T triplane (400 Curtiss C.D.12), a C.O.5 (400 Liberty), a D.H.4L (450 Liberty), four D.H.4B's (400 Liberty), two Fokker C.O.4's (400 Liberty), a Le Père (450 Liberty), a Vought V.O.1 (210 Wright J.1) and two X.B.1A's (350 Wright). This race was won by Lieut. C. McMullen (Army) on a Fokker C.O.4 at an average speed of 139·03 m.p.h. Lieut. H. K. Ramy (Army) on a D.H.4L was second with a speed of 137·54 m.p.h., and Lieut. L. H. Smith (Army) on a C.O.5 finished third at a speed of 135·35 m.p.h. Lieut. Allen (Navy), flying the Curtiss triplane, was approaching the flying field at the end of the first lap at about 500 ft. up when the crankshaft of his engine broke. In order to avoid the crowd and sundry machines directly in his path, he swung sharply round and came down in a bumpy and muddy field. The machine bounced some 50 ft. and then turned over on its back. Allen and his mechanic tucked their heads within the fuselage, which fortunately held fast, and though the machine was smashed, both crawled out unharmed.

The programme for the following day provided for two events of considerable interest—the Aviation Country Club of Detroit race for light commercial 'planes and the Merchants' Exchange Trophy race for large-capacity "freight or passenger" machines. Incidentally, the latter turned out to be, with one exception, bombers. The first event was flown over five laps (250 kms., or 155·34 miles), and produced seven starters as follows:—C. S. Jones (Curtiss Oriole), Lieut. H. R. Harris (Huff-Daland "Petrel 4," 190 Wright E.2), J. Atkinson (Bellanca C.F., 95 Anzani), J. L. Burns (Le Père, 210 Hispano), F. Robertson (Standard V1 Special, 154 Hispano), W. B. Robertson (Raco, 154 Hispano) and P. Hutton (Laird Swallow, 98·5 Curtiss O.X.5).

Contestants were placed according to a "figure of merit," which was determined by dividing the pay load by the horsepower and multiplying the product by the speed. The winner of this event was Atkinson, Hutton being second and "Casey" Jones third. The others dropped out of the race at various stages.

The second event was run over six laps of the course (300 kms., or 186·42 miles), and the machines had to be capable of carrying at least a 2,000-lb. load in addition to crew, pilot and observer. Eight machines started, five of which were twin-engined Martin Bombers, two Douglas D.T.4's (single Wright T.2), and one was a Fokker T.2. One of the D.T.4's dropped out on the second lap, and a Martin also retired on the fourth lap, but all the rest finished. The winner of this event was 1st Lieut. H. L. George (Army) on a Martin with a speed of 114·28 m.p.h., Lieut. M. A. Schur (Navy) on a D.T.4 being second with 107·62 m.p.h. The Navy also won third place by 1st Lieut. W. S. Hallenberg on another Martin. An illustration of the D.T.4 appears on p. 688.

Perhaps the most spectacular and thrilling of all the races was that for the *Detroit News* Air Mail Trophy, over six laps of the course (300 kms., or 186·42 miles), which was held the morning of the Pulitzer race. In this no fewer than 15 U.S. Air Mail 'planes (converted D.H.'s with Liberty engines) started at 20-second intervals. Out of these only three did not complete the course. That it was a close race may be judged from the fact that the average speeds of the machines varied only from 111 to 124 m.p.h., and at the finish about 11 mins. separated first and last man home. This event was won by J. F. Moore, of the Central Division (Air Mail), at an average speed of 124·98 m.p.h. C. D. Smith, of the same Division, was second with 120·83 m.p.h., and P. F. Collins, of the Eastern Division, was third with 120·09 m.p.h.

LONDON TERMINAL AERODROME

Monday evening, November 5, 1923

THE Hamburg service just now does not seem to attract many passengers, and last week the Daimler Airway tried the experiment of flying through to Berlin, via Hanover; that is to say, they took the direct flight to Berlin without going round by Hamburg and Bremen. This enables them to save enough time to allow the flight from London to Berlin to be completed in the hours of daylight, and I understand that, owing to the success of the experiment, this service is now to be run regularly, when it is hoped that a much greater number of passengers will avail themselves of the facility.

The Customs' House is absolutely packed to the ceiling with goods consigned to Cologne by the Instone Air Line, and so great is the pressure on the space that a new addition is to be made in order to accommodate this mass of air-borne goods. On Sunday, when there is usually no service, the Instone Air Line had two machines in, and two machines out, completely filled with goods.

Taking advantage of a strong following wind, Mr. F. L. Barnard, of the Instone Air Line, created a new record by flying a fully-laden D.H.34 from London to Cologne in 2 hrs. 10 mins. official flying time on Sunday. He was passing Dunkirk only 40 minutes after leaving Croydon. His time from aerodrome to aerodrome, cutting out getting off, circling, and circling and landing at the other end, was 2 hrs. 5 mins.

The Surrey Flying Services D.H. 9 left early on Sunday with films of the royal wedding, which were got through to Sweden in time to be exhibited at the cinemas there on Sunday evening. In addition, Mr. Cobham was waiting with a machine at Rotterdam for films and pictures, which were sent over to him by the night boat.

LIGHT 'PLANE AND GLIDER NOTES

Those wishing to get in touch with others interested in matters relating to gliding and the construction of gliders are invited to write to the Editor of FLIGHT, *who will be pleased to publish such communications on this page, in order to bring together those who would like to co-operate, either in forming gliding clubs or in private collaboration.*

AT a recent meeting of the *Association Française Aérienne* in Paris the holding, in 1924, of a *Tour de France* for light aeroplanes was discussed, and it was decided to hold the competition on or about August 10, 1924. It was also decided to make the competition international. The actual rules have not yet been definitely decided upon, but it seems likely that a formula will be used in judging the competing machines. No distinction will be made in the classification between single-seaters and two-seaters, except that one engine cylinder capacity will be used for the one and another for the other type, while consumption limits will be imposed in elimination trials before the actual competition.

* * *

COMPETING machines must have obtained their air-worthiness certificate from the *Service de la Navigation Aérienne* (for French machines) or a similar institution in foreign countries. In the case of British machines the Air Ministry air-worthiness certificate would be required, although it seems probable that, should British competitors prefer to obtain the S.N.Aé. certificate they would be permitted to do so. The A.F.A. is requesting the S.N.Aé. to issue a special certificate for light aeroplanes, after consultation with, and on the advice of, the *Section Technique*.

* * *

THE start for the *Tour de France* will be simultaneous for all the competing machines, which will be lined up with engines stopped, so that after the starting signal has been given any time spent in starting the engines will count as flying time. At the intermediate aerodromes competitors will be started off again in the order of their arrival. Landings between the compulsory halts are permitted, as is also replenishment of fuel.

* * *

THE weight of the pilot must be made up to a minimum of 75 kilos. (165 lbs.), and in the case of two-seaters the combined weight of pilot and passenger must be made up to a minimum of 150 kilos. (330 lbs.). The passenger may be changed at the compulsory halts, but the new passenger must then be weighed so as to ensure that his weight is not less.

* * *

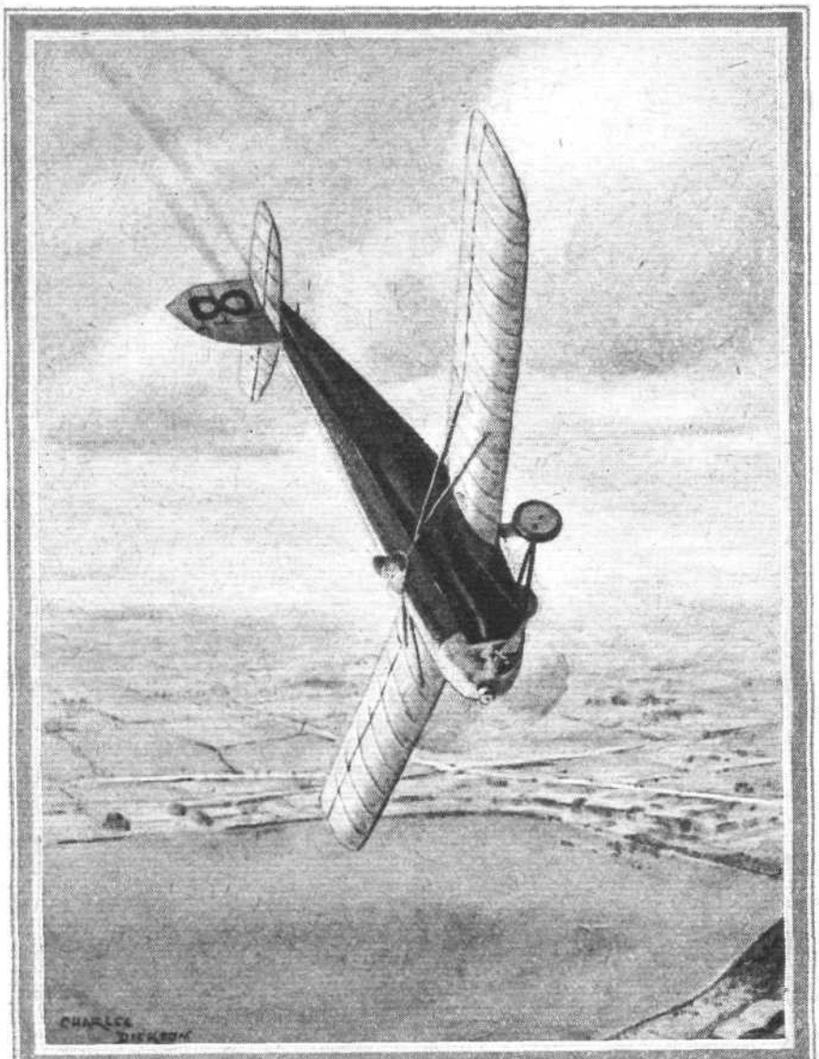
THE wings, fuselage, engine crank-case, and cylinders will be stamped and sealed. All other parts may be replaced. When all the rules have been finally decided upon they will be submitted to the *Commission Sportive* of the French Aero Club for approval, and the Under Secretary of State for Air, M. Laurent Eynac, will be asked to let [illegible] two great institutions which he represents, the *Section Technique* and the S.N.Aé., take part in the organisation of the competition.

* * *

THE *Tour de France* should afford a good opportunity to British constructors to participate in an international event, and from the performances attained at Lympne one has little doubt that British machines would acquit themselves creditably in competition with the machines of other countries.

* * *

ALTHOUGH Germany led the way in the matter of gliding it is a remarkable fact that but little progress has been made there with the logical development—the light aeroplane. A few experiments, about which but little became known outside those directly concerned, were made last year with the Budig machine, several illustrations of which were published in our issue of January 4, 1923. Now comes news from Germany that the Aachener Segelflugzeugbau G.m.b.H have produced a light monoplane on which during the latter part of September and the beginning of October Herr Cand. Ing. Hoppe made several successful flights. This machine is a semi-cantilever high-wing monoplane, with back-swept wing tips and simple external bracing consisting of a single strut on each side, running from the bottom rail of the fuselage to the front spar. The wing span is 13 metres (42 ft. 7 ins.) and the wing area 15 sq. m. (161·5 sq. ft.). The engine is of 8 h.p. The machine proved to get off quite quickly, and had a rate of climb (initial) of about 1 metre per second (200 ft./min.), while the top speed was in the neighbourhood of 70 km. (43·4 m.p.h.).



The D.H.53 light monoplane "stunting" at Hendon meeting.

* * *

WHILE on the subject of German gliders and light 'planes, it may be of interest to give a brief account of a very fine flight made by Herr Bottsch on the Darmstadt glider "Konsul," during which a distance of 19 km. (11·8 miles) was covered in a cross-country flight. The flight took place on September 29, but it is not until now that authentic information relating to it has become available.

* * *

STARTING from the top of the Wasserkuppe in the Rhön mountains, Herr Bottsch circled over his starting point several times, and then, finding that conditions appeared favourable, he decided to attempt a cross-country flight. Two routes presented themselves, one to the north and the other to the west. Herr Bottsch decided in favour of the latter. Skirting the hill sides he flew over Poppenhausen, Gersfeld, Lütter, and Rothemann, and finally landed at Kerzell, where he would

have had to fly under some high-tension electric cables, with the possibility of having to land on a railway line along which a heavy goods train was just passing. The distance covered, in a straight line, was, as already mentioned, about 12 miles. It is of interest to note that the altitude difference between the starting and alighting points was about 550 metres, so that the gliding angle worked out at approximately 1 in 34·6. As this is more than double the actual gliding angle of the machine Herr Bottsch evidently got quite a good deal of lift from the various spurs and slopes along the course.

* * *

IT is of interest, in this connection, to mention that for some distance Herr Bottsch was followed by two eagles, one of which could not reach the altitude of the glider, while the second managed for a short time to follow the machine about 20 ft. below it and 50 ft. away from it. It was noticeable that the birds could not keep up with the machine in the matter of speed either, as even the one most nearly on Bottsch's level had partly to fold its wings to try to get a little extra speed. However, it soon gave up the race.

* * *

ON more than one occasion we have expressed regret in these columns at the way in which pure gliding has been allowed to drop entirely in this country. While we are firm believers in the future of the light aeroplane, we do think that no harm would have been done had its advent been delayed for a year or two, so as to give us an opportunity to make a more scientific study of the problems of gliding and soaring flight. At any rate we should carry out practical research along both lines rather than develop the power-driven machine at the expense of the glider. In Germany the students, although realising the possibilities of the light 'plane, have not been in a hurry to abandon gliding for the flying of light 'planes. Although this has no doubt been due partly to the absence of a suitable low-power engine at a reasonable price, it is, we think, far more caused by the desire of German experimenters to learn more about gliding and soaring before proceeding to motor-driven flight. And in this we think they are right.

* * *

IN view of the lack of knowledge to which we still have to confess when it comes to the problems of soaring flight (gliding in ascending currents is very simply explained and does not appear to offer anything specially interesting from a scientific point of view), we welcome the paper to be read by Dr. E. H. Hankin, M.A., before the Institute of Aeronautical Engineers this week (on Friday, November 9). Dr. Hankin has made an exceptionally close study of the evolutions of birds in gliding, soaring, and circling flight, and is thus extremely well qualified to speak on the subject he has chosen, *i.e.*, "The Soaring Flight Question." We have been privileged to see an advance copy of the paper, and would advise all who can possibly do so to go to the lecture on Friday (tomorrow) evening. Dr. Hankin devotes a good deal of the paper to observations of steep upward glides in *descending* currents, and as this phenomenon appears in direct opposition to the accepted theory of gliding in *ascending* currents, the lecture and the discussion following it should be of more than ordinary interest. We believe that the lecture hall at the Engineers' Club, Coventry Street, W. 1, is open to non-members of the Institution of Aeronautical Engineers, and if any non-member will apply to the Hon. Secretary, Mr. L. Howard Flanders, I.Ae.E., 60, Chancery Lane, London, W.C. 2, we believe they will have no difficulty in securing admission to the lecture. The meeting commences at 6.30 p.m.

* * *

FLYING across the Atlantic in a light 'plane sounds rather a tall order. Yet we have been informed that a scheme to make the attempt has been put forward in all seriousness by a British pilot. At first sight the proposition seems preposterous, until it is remembered that the fuel consumption of a light 'plane engine is very low, and that consequently the amount of fuel to be carried for a given distance is not very great. Let us examine briefly the technical factors involved in such a scheme.

* * *

THE distance across the Atlantic is approximately 2,000 miles (from Ireland to St. John's, Newfoundland). Assuming that the light 'plane to be used would do an *average* of 50 miles per gallon, then in still air 40 gallons of petrol would be required. At least 25 per cent. should be added to that for emergencies, giving a total of 50 gallons, or 350 lbs. Add to that 50 lbs. for oil, and the fuel weight becomes 400 lbs. Probably the machine could be built for an empty weight of 450 lbs., so that if the weight of the pilot is 150 lbs., the total loaded weight would be in the neighbourhood of 1,000 lbs.

* * *

IF we assume that the engine used would develop, at the start, 25 h.p. the power loading becomes 40 lbs./h.p. By keeping the wing loading fairly low, say at 5 lbs./sq. ft. (giving an area of 200 sq. ft.) it would probably be possible to get such a machine to take off with its full load. If necessary it might be assisted by rubber cord launching.

* * *

FROM the technical point of view, therefore, it would appear that the scheme is just about possible. A small element of bad luck would be sufficient to wreck it, but, on the other hand, a following wind and favourable weather conditions as regards visibility, etc., would help very materially and would reduce the time taken.

* * *

THE greatest obstacle appears to be the human element. It could not be assumed that an average speed much greater than 50 m.p.h. could be maintained, which would mean a flight of 40 hours' duration. It would be a tremendous strain on a pilot to keep going for that length of time, although a man in first-class condition and in thorough training might manage to get through the ordeal.

* * *

THE engine question would also be serious, but to take but one example, it should be remembered that the Bristol "Cherub" has already successfully passed a non-stop run of 50 hours at 90 per cent. of full power. This was, of course, on the test bench, where an engine can be better looked after than it can in the air, but, nevertheless, there is reason to believe that even in the air a non-stop run of 40 hours or so would not be beyond the capacity of a good engine.

* * *

THE scheme is not without its fascination, and if nothing else it does call attention to the fact peculiar to the low-power aeroplane that the addition of fuel for several more hours' flying means but a relatively small increase in the weight. For rough and ready comparisons one may take the consumption as 1 gallon per hour, whereas in the ordinary aeroplane of even a moderate power of 100 h.p. or so the consumption is not far short of ten times that amount. Before starting on such an ambitious scheme as that outlined, however, we think it would be advisable to attempt a few duration "records," or even distance flights overland. London to Marseilles would not be bad for a start, and if the flight from London to Malta could be accomplished by a light aeroplane before the three-engined commercial aeroplane for which the Air Ministry is issuing specifications even comes into existence, the situation would not be without its humorous side.

* * *

MR. S. H. PLATEL, of 14, Cecil Mansions, Marius Road, Balham, writes us to say that as an ex-Observer of the R.F.C. he would be pleased to hear from anyone intending to start a glider club, as he is keenly interested in this new phase of aviation.

* * *

FROM Hill Bros., 4, Evington Street, Leicester, we have received a request to publish the following announcement: "Will those residing in or near Leicester, who would be interested in the formation of a Light 'Plane or Glider Association in Leicester please communicate with Hill Bros. at above address?"

4½ Miles per Minute

FROM New York it is reported that Lieut. Brow, who was second in the Pulitzer Trophy Race, on November 2, established a new world's speed record by flying over the 3 km. straight course at an average speed of 257·5 m.p.h. Ensign Williams, winner of the Pulitzer, also made an attempt, and actually improved slightly on Brow's speed. On finding this Brow went up again, and is credited, on his last attempt, with a speed of 265 m.p.h.

Mr. Rowledge's Paper before I.Ae.E.

OWING to an oversight the date of Mr. Rowledge's paper on "Water-cooled Aero Engines" has been given as December 9. This should be December 7. The paper is to be delivered before the Institute of Aeronautical Engineers at the Engineers' Club, Coventry Street, at 6.30 p.m. Non-members of the Institute will be admitted on application to the Hon. Secretary, Mr. L. Howard Flanders, Institute of Aeronautical Engineers, 60, Chancery Lane.

A NEW AMERICAN BOMBING 'PLANE

The Douglas D.T.4.

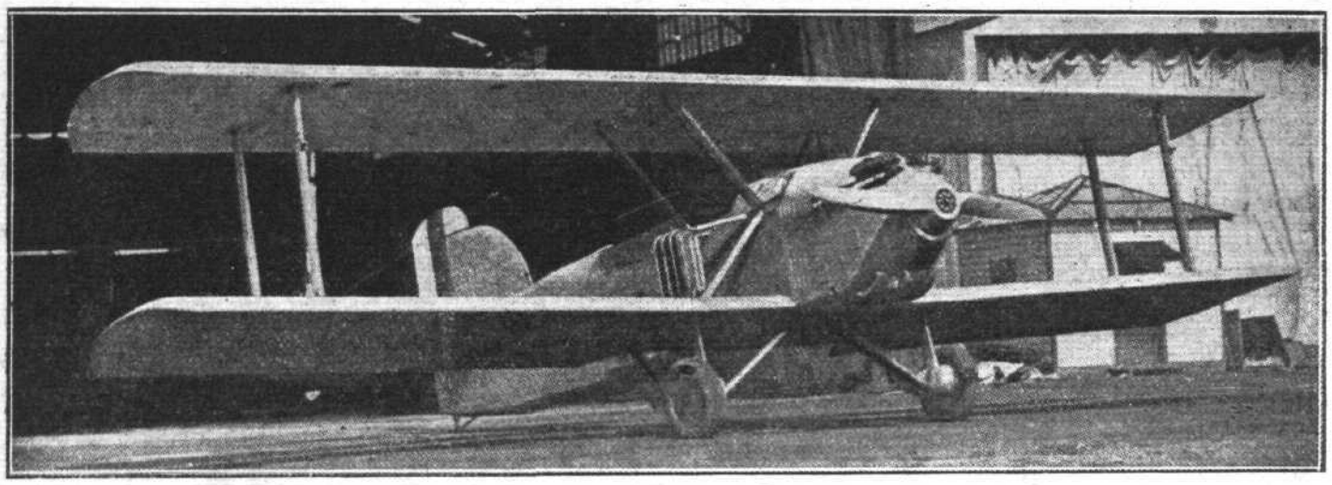
A LARGE single-engined bomber, known as the D.T.4, has recently been produced by the Douglas Company of Santa Monica, California, for the U.S. Naval Air Service, and we give below a few particulars together with an illustration of this machine, for which we are indebted to our American contemporary *Aviation*.

The D.T.4 is a tractor fuselage two-bay biplane, with a comparatively deep fuselage. The landing gear has a wide track, and is of the two-wheel type, each wheel being carried by a V mounted on the lower plane centre sections, an additional bracing strut extending from the wheel hubs to the fuselage. Plenty of space is thus provided for the bomb gear. This machine may also be converted into a seaplane by substituting floats in place of the wheels.

Compared with the twin-engined Martin bomber—a standard type in the U.S. Air Service—the D.T.4 possesses several advantages. It will carry a heavy bomb load at a higher speed and to a higher ceiling, for one thing, whilst as a type it scores in the matter of first cost and in operation and upkeep.

The D.T.4 bomber, fitted with a 600 h.p., 12-cylinder Wright T.2 engine (high compression), will carry a heavy bomb load to a service ceiling of from 14,000 to 17,000 ft. without the use of a super-charger. It has, furthermore, good manœuvrability, together with high speed and low landing speed.

The following figures of a series of tests will give an idea as to the performance of the D.T.4. The useful load includes a crew of two, two guns, W.T. equipment and instruments, and fuel for approximately 3 hours' cruising and additional tankage for about 1 hour.



AN AMERICAN BOMBER : The Douglas D.T.4 biplane, a bombing machine, fitted with a 600 h.p. Wright T.2 engine, built for the U.S. Naval Air Service.

Bomb load (lbs.)	1,650	1,000	500
Gross weight (lbs.)	6,800	6,040	5,540
Service ceiling (ft.)	14,300	16,200	16,900
Absolute ceiling (ft.)	16,200	18,000	18,500
Speed (m.p.h.)	115	116	116.5
Stalling speed (m.p.h.)	53	51	49·2

SOME RECENT DEVELOPMENTS IN AIRCRAFT INSTRUMENTS

"INSTRUMENTAL or mechanical science is very noble, and useful beyond all others." This statement, ascribed to Leonardo da Vinci, was quoted by Major Wimperis in the introduction to his paper, under above title, read before the Royal Aeronautical Society on November 1, 1923. The lecturer also quoted a more recent authority, Air-Commodore Brooke-Popham, as stating that an aeroplane was an encumbrance unless one could get it where it was wanted. As the main purpose for which aircraft instruments exist is to enable one to get aircraft "where they are wanted" the lecturer considered the importance of his subject established. We have not here the space to refer other than briefly to the admirable paper, and those wishing for full particulars should obtain forthcoming issues of the Society's *Journal*, in one of which the paper will be reproduced in full.

Referring to instruments for D.R. (Dead Reckoning) navigation, the lecturer stated that the chief new development had lain in the notable improvement that had taken place in the magnetic compass, and to which he referred later in detail. Apart from that, he said, it had been found convenient so to modify the standard bearing plates and drift indicators as to combine the advantages of the wind gauge bearing plate with those of the old aero bearing plate, and to do this in such a way as to enable all course and distance calculations to be performed semi-automatically.

Turning to instruments for astronomical navigation, the lecturer outlined the fundamental principle, consisting in measuring the zenith distance of any heavenly body and of reducing the observations, in conjunction with a chronometer reading, so as to give a "position line" on the chart. He then pointed out briefly the principle of the ordinary naval sextant, and that even those provided with bubbles were not necessarily suitable for aeroplane problems, but that they could be so rendered by an optical design which causes the image of the bubble to move, when the sextant is unavoidably tilted by the rolling or pitching of the aircraft, in the same direction and at the same rate as the object. Major Wimperis then referred to the best known of the bubble sextants for aircraft, that developed by the R.A.E., of which he showed slides. The accuracy of this type of bubble sextant is considerable, and the lecturer stated that the "probable error" of the resulting "position line" was from 6 to 10 miles under favourable conditions, and might be as high as 40 miles under bumpy conditions.

Regarding the methods used for reducing the sextant observations the lecturer called attention to the unsuitability of using reference books, as does the maritime navigator, and referred to the slide rule devised by Capt. Bygrave of the Air Ministry Laboratory as the best solution so far. This instrument was found to be accurate enough, was conveniently compact in its shape, and was "fool-proof" to a remarkable degree. The instrument consists of two small concentric cylinders carrying spiral scales (one of log cosines and the other of log tangents). Any sextant observations could, he said, be reduced in three minutes of time with an accuracy of within two minutes of arc, even by observers ignorant of the theory of what they were doing.

On the subject of altimeters the lecturer briefly recalled the reasons for the present retention of the "Trade Scale," which is based on the assumption that the temperature of the atmosphere is everywhere 10° C., instead of the more probable temperatures of 15° at sea-level and 60° or 70° less at 30,000 ft. actually obtaining. The effect of this assumption may be to put in error by as much as 2,000 or 3,000 ft. the altimeter

reading at 30,000 ft. Major Wimperis then referred to the figure adopted by the French *Section Technique* of a temperature decrease of 6·5° C. per kilometre of ascent, taken in conjunction with a constant surface temperature of 15° C. Using the S.T.Ae. rule as a basis the probable error would be reduced to less than 500 ft.

A large proportion of Major Wimperis' paper was devoted to the subject of the magnetic compass. The very nature of the subject makes it almost impossible to condense it and still retain its value, and those interested should obtain a copy of the paper so as to study it in detail. The lecturer referred to the difficulties of damping the oscillations set up even in moderately "bumpy" weather, and to the peculiarity of the magnetic compass of giving a misleading indication during a turn off north—known as the "Northerly turning error." Weakening the magnetic moment or increasing the inertia of the moving system did not solve the problem, as both tended to make the needle stick. A solution was found by Campbell and Bennett at the Admiralty Compass Observatory, who in 1918 showed a way in which the desired slowness of response could be obtained without lowering the magnetic moment very much on the one hand or increasing the moment of inertia on the other. This method consisted in attaching radial "feelers" of thin wire to the magnetic system. These "feelers" on moving through the liquid would set up small eddies and thus dissipate energy. In this way it was found that the compass could even be made "aperiodic," but experience had shown that the best results were obtained when the amount of damping was kept within 70 per cent. of that which would just cause the motion to be aperiodic. Brief reference was also made to the gyro turn indicator.

In conclusion the lecturer referred to the development of aero engine indicators, to the use of the Challenor electric air-flow meter and to the R.A.E. indicator, in which the instantaneous pressure in an engine cylinder opposes on one side of a small piston a steady and known air pressure on the other, so that at the moment when the two are equal an electric current is broken which sparks through a drum of paper moving at a speed proportional to that of the engine.

Two appendices to Major Wimperis' paper gave respectively an explanation of the theory of the Bygrave "position line" slide rule, and an exposition of the variation of atmospheric pressure and density for a constant lapse rate. Both are extremely interesting and should be carefully studied.

CORRESPONDENCE

The Editor does not hold himself responsible for opinions expressed by correspondents. The names and addresses of the writers, not necessarily for publication, must in all cases accompany letters intended for insertion in these columns.

LIGHT 'PLANES WITH "SIDECAR"

[2077] In FLIGHT of October 25 last reference was made to the possibilities of interchangeable fuselage-wing units for one-two-seater light 'planes. It would seem that to change the engine, the seating part of the fuselage, and the wings would leave only the undercarriage, the rear part of the fuselage, and the tail unit applicable to both types. Seeing that the latter parts are by no means the most expensive parts of the 'plane, and that they form only a small proportion of the whole, there will be little saving on the expense of maintaining two separate machines. The following construction which I have devised makes the proportion of temporary parts much smaller, and no part of the single seater is changed, the two-seater being formed from it by *added* parts only.

In the attached drawings the figures to the left of the line XY are the single-seater, those to the right being the two-seater. The full lines represent the permanent parts of the structure, and the broken lines the additions. The bracing is of Warren-truss form, and the additions consist of one wide top centre section, two short extensions to the lower centre section (which is permanent), and the necessary bracing. Fig. 1 shows how the single-seater top 'plane is removed in its two halves, with the outer bracing struts and the end fairing of the lower 'plane; these parts being re-connected to the added parts. Fig. 2 shows how the ends of the added top centre section are "raked," giving the planes of the two-seater form a "sweepback." Fig. 3 shows how the lower plane extension is "raked" with the same object. By this means the "sweepback" (necessary to balance the altered centre of gravity due to the passenger) is achieved without alteration to the permanent planes and bracing.

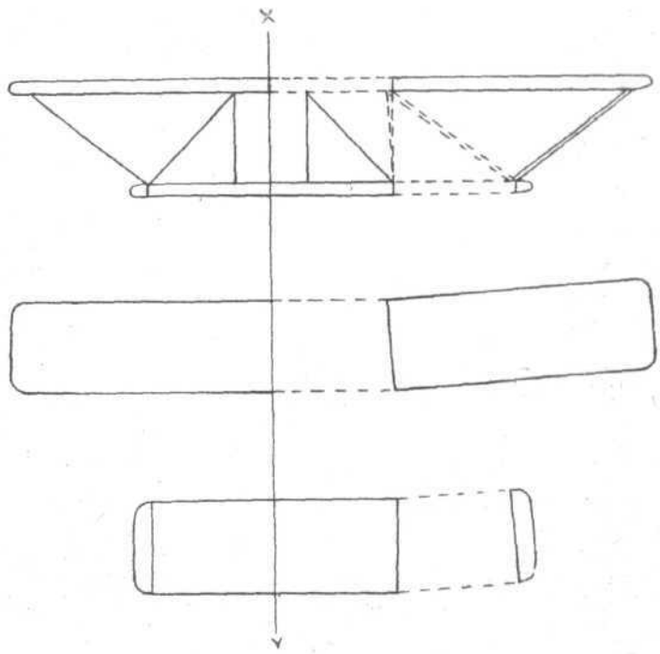
As regards the accommodation for the passenger, the cockpit provided for him can be covered over when the plane is in its single-seater form.

From the point of view of stability, the increased span should equalise the aileron effect for the increased area, and the "sweepback" of the planes should virtually increase the tail plane area. As the side area is unchanged, the existing rudder should suffice.

Altogether this scheme offers two machines, with the extra expense of only three short pieces of plane and a few extra struts. With the truss bracing the necessary spar joints are a simple matter.

Concerning the change of engines: this point arises in any scheme for one-two-seater machines. Provided the power of the engine is sufficient to fly the two-seater, retaining the same engine will result in a fast single-seater; but its increased speed will probably be at the expense of economy. So it might be desirable for single-seater "runabout" use to substitute a lower-powered engine, which can still bear the same relation to the centre of gravity by being set farther forward than the heavier engine, preferably being designed as a unit with its bearers and tanks. In any case the propeller of the two-seater will have to be changed for the single-seater form.

It even seems that with three propellers, two engine units and the spare parts mentioned above, one could have the use of three machines.



I must mention that I have no financial interest in the development of the light 'plane; but the above ideas occurred to me, and I think they may be of interest to you and your readers.

ARTHUR PRIESTLEY

Hounslow, November 3, 1923.

Dominion Premiers at Croydon

THE visit to Croydon by Prime Ministers and other representatives of the Dominions and India which has been arranged for Saturday next (November 10) will, we learn from the Air Ministry, be a private one, and the public will not be admitted to the aerodrome. A similar visit was made by the Dominion Prime Ministers when they attended the Imperial Conference in 1921. An opportunity will be afforded of inspecting the present traffic arrangements at the aerodrome, and various types of military and civil aircraft will be demonstrated.

The visitors will arrive about 2.30, and it is expected that the programme planned will be finished shortly after 5 p.m.

PERSONALS.

Married

Flight-Lieut. ERIC J. WEBSTER was married on October 27, at St. Paul's, Woldingham, to DOROTHY MARGUERITE, elder daughter of Mr. and Mrs. F. G. JONAS, of Wood Lea, Woldingham.

To be Married

The marriage will take place at Bombay, early in December, between Capt. WILLIAM ANDREW HANNAY, A.F.C., Adjutant 2nd King's Regt. (Liverpool), and Mrs. EYRE, younger daughter of Mr. CHARLES LEE, J.P.

The engagement is announced between Capt. RALPH MICHAELSON, late R.A.F., eldest son of Mrs. Michaelson, of 36, Fitzjohn's Avenue, Hampstead, and GERTRUDE MARGARET, eldest daughter of Mr. and Mrs. J. R. FALCONER, of Oakhurst Court, Godstone, Surrey.

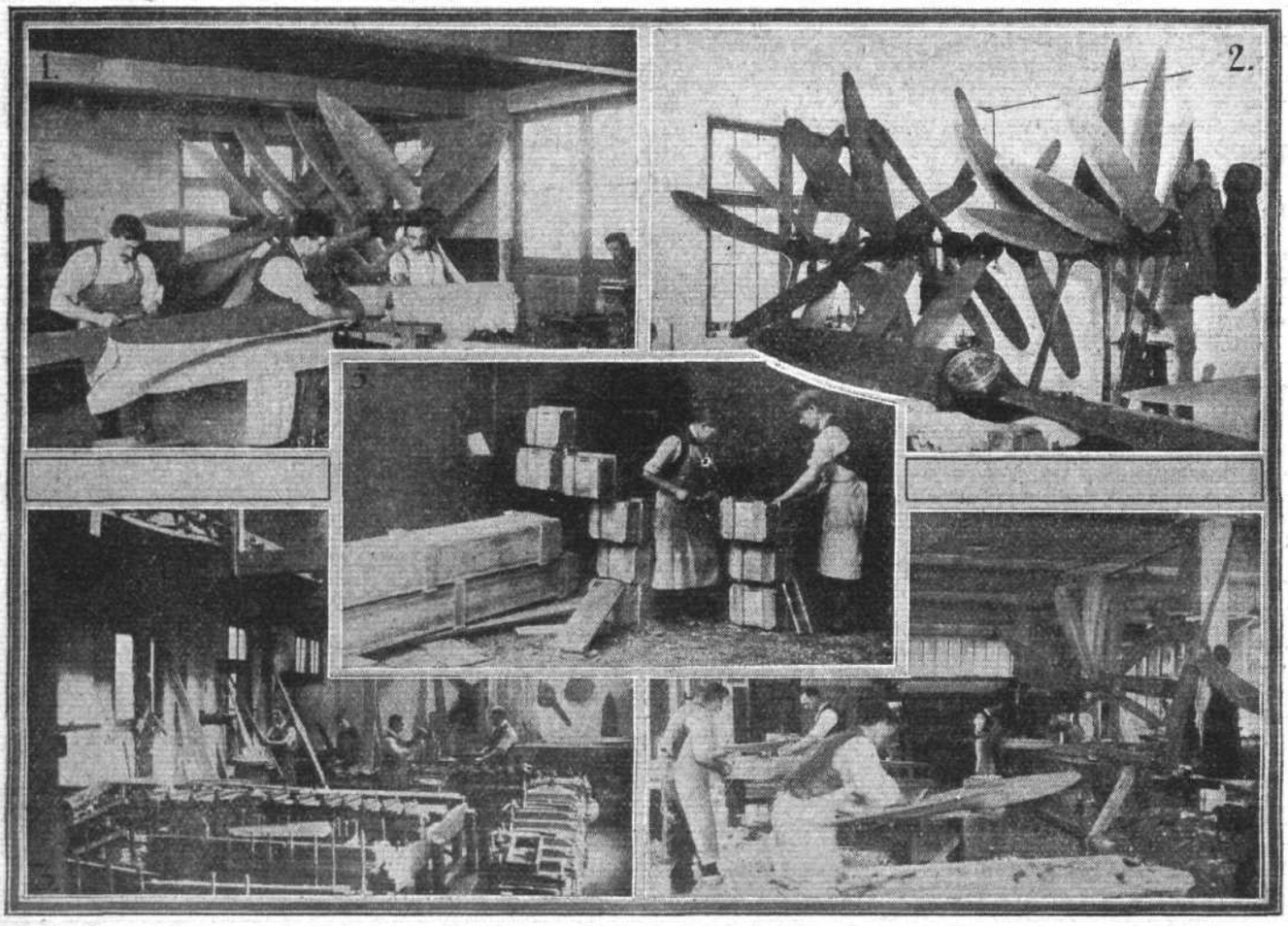
A marriage has been arranged and will take place shortly between Air Commodore A. E. BORTON, C.B., C.M.G., D.S.O., A.F.C., younger son of Lieut.-Col. A. C. Borton, J.P., D.L., of Cheveney, Kent, and MURIEL AGNES SLATER, daughter of the late Canon H. B. STREATFEILD, M.A.

Items

The will of the late Capt. LESLIE GEORGE ROBINSON, of the Croydon Aerodrome Hotel, Waddon, Surrey, who died at Ivinghoe, Bucks, on September 14, in the accident to the London to Manchester aeroplane, has been proved at £1,342.

Lieut. Aviateur Chevalier WILLY COPPENS, Air Attaché to the Belgian Embassy, left London on November 1 for Brussels.

Amongst those who were present at the afternoon party given by Their Majesties the King and Queen at Buckingham Palace on October 30, were the Duke and Duchess of Sutherland, Air Chief-Marshal Sir Hugh and Lady Trenchard, Sir Samuel and Lady Maud Hoare, Sir William and Lady Joynson-Hicks, etc.



FALCON AIRSCREWS IN THE MAKING : Supplementing the article on Falcon airscrews which appeared in our issue for September 27 last, are the five views shown above, taken at the Falcon Works, 113, Cottenham Road, N. 19. 1. Covering the blades with fabric and affixing metal tips. 2. A corner of the finishing shop. 3. The glueing room. 4. Shaping room ; giving the blades their final shape by hand. 5. Packing finished airscrews for despatch.

FLIGHT

THE ROYAL AIR FORCE

London Gazette, October 30, 1923

General Duties Branch

Sqdn. Leader J. H. Lidderdale, O.B.E., is placed on Retired List on account of ill-health, and is granted rank of Wing Commdr.; Oct. 31. Pilot Offr. D. F. A. Apthorp is placed on Retired List on account of ill-health; Oct. 31.

Stores Branch

Flying Offr. H. A. Murton is granted a permanent commn. for accountant duties; Oct. 31. The following are granted short service commns. as Pilot Offrs. on probation for accountant duties, with effect from, and with seny. of, Oct. 22:—C. G. Bull, C. W. Cackett, J. Charles, E. F. Colman, W. R. Donkin, C. P. Puckridge, C. B. Rawlins, F. C. Warner.

Medical Branch

W. J. Hutchinson, M.B., is granted short service commn. as Flying Offr., with effect from, and with seny. of, Oct. 15.

Chaplains' Branch

The Rev. B. W. Keyner, O.B.E., M.A., resigns his permanent commn.; Oct. 29.

Reserve of Air Force Officers

The following are granted commns. on probation in General Duties Branch in ranks stated, with effect from dates indicated:—

Class A.—Flying Offr.—A. J. Winstanley; Oct. 23.

Class BB.—Pilot Offr.—E. P. Smith; Oct. 30.

Class A.—The commn. of Pilot Offr. on probation G. C. D. Lindsay is terminated on cessation of duty; Sept. 28.

Class B.—Observer Offr. J. S. F. Watson relinquishes his commn. on enlistment in the Army; Oct. 9.

Class C.—Flight Lieut. T. R. Hackman is transfd. from Class A to Class C; Sept. 24.

Memoranda

The permission granted to Sec. Lieut. B. Knee to retain his rank is withdrawn on his enlistment: Oct. 1. The permission granted to following Sec. Lieuts. to retain their rank is withdrawn on their enlistment in Territorial Army. *Gazettes* of May 3, 1921, are cancelled:—A. J. McD. Grimston, G. Stannard, R. C. Hatcher.

ROYAL AIR FORCE INTELLIGENCE

Appointments.—The following appointments in the R.A.F. are notified:—

General Duties Branch

Air Commodore C. A. H. Longcroft, C.B., C.M.G., D.S.O., A.F.C., to H.Q. Coastal Area. 29.10.23, for special duty.

Squadron Leader N. M. Martin, C.B.E., to R.A.F. Base, Leuchars. 19.11.23.

Flight Lieutenants: A. L. Neale, M.C., to No. 1 Flying Training Sch., Netheravon. 22.10.23. K. M. St. C. G. Leask, M.C., to Air Ministry. 5.11.23, on transfer to Home Estab. A. H. Goldie, to R.A.F. Depot. 1.11.23, pending embarkation overseas. P. H. Mackworth, D.F.C., to R.A.F. Base, Calshot. 20.11.23. J. H. Dand, M.B.E., to Admiralty Compass Observatory, Slough. 3.12.23.

Flying Officers: F. H. D. Henwood, D.F.C., to No. 7 Group H.Q., Andover. 1.11.23. (Hon. Flt. Lieut.) T. K. Burton, to R.A.F. Depot. 23.10.23, on appointment to a Temp. Commn. on being seconded from the Army. A. F. Lingard, to R.A.F. Depot. 25.10.23, on appointment to a Short Service Commn. P. J. Hayes, A.F.C., to R.A.F. Depot. 27.10.23, pending disposal on transfer to Home Estab. G. A. Kysh, to R.A.F. Depot (Non-effective Pool). 1.9.23, on transfer to Home Estab. E. K. Blenkinsop, to No. 1 School of Tech. Training (Boys), Halton. 8.11.23. (Hon. Flt. Lieut.) L. F. Marson, M.C., to No. 2 Sqdn., Andover. 1.11.23, instead of to No. 4 Sqdn. as previously notified.

Pilot Officers: N. P. C. Mellor, to No. 7 Sqdn., Bircham Newton. 15.10.23, instead of to R.A.F. Depot as previously notified. E. C. Roark, to No. 7 Sqdn., Bircham Newton. 4.9.23, instead of to R.A.F. Depot as previously notified. R. G. A. Vallance, to No. 4 Sqdn., S. Farnborough. 19.10.23. F. V. Beamish and A. D. Davies, both to No. 4 Sqdn., S. Farnborough. 18.9.23. F. J. Fressanges, to No. 207 Sqdn., Eastchurch. 3.10.23. N. A. P. Pritchett, to No. 207 Sqdn., Eastchurch. 5.10.23. F. R. Lines, to remain at No. 1 Flying Training Sch., Netheravon, instead of to No. 24 Sqdn. as previously notified.

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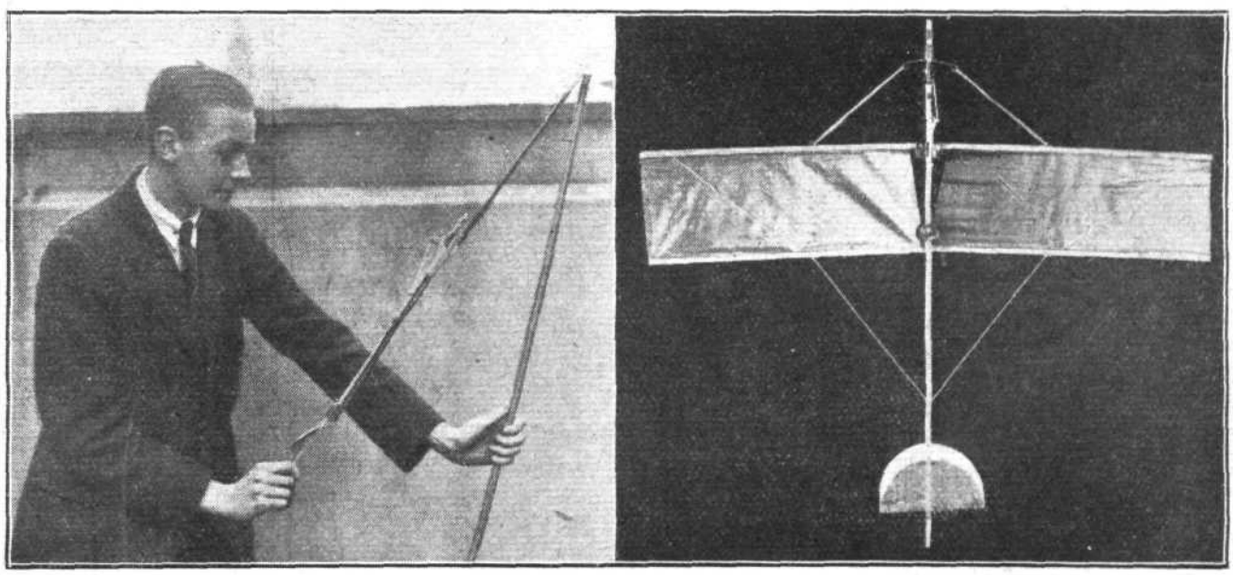
AN INGENIOUS MODEL GLIDER

IT is not, perhaps, generally known that quite a lot of amusement—and instruction, for that matter—may be obtained from model gliders. The principal obstruction, however, in the way of model gliding is that the necessity for suitable gliding grounds and weather conditions rather limit the extent to which one may participate in this form of amusement. An extremely novel form of model glider—the invention, we understand, of a Russian engineer, but British-built throughout—has just been put on the market, which to a large extent overcomes this drawback in that, given a fairly large open space, gliding may be indulged in under almost any conditions.

The "Olympic" glider, as it is called, is shown in the accompanying illustrations, from which it may be gathered that the glider, with its wings folded, is shot into the air by means of a catapult. The shock caused by catapulting the glider causes a small weighted catch to fall, thereby releasing a short length of twisted rubber. This latter unwinds, and in turn releases a rubber band holding the folded wings in place along the "backbone" of the glider. Immediately this rubber band is free, the wings are pulled open by means of elastic guys, and the model glides to earth. All these operations, of course, occur in rapid succession, but as the glider leaves the catapult at a considerable speed the wings do not open before the glider has reached its "ceiling." In starting another glide, the wings are folded back, rolled up and secured thus by the rubber band, and the releasing motor wound up, the weighted catch being locked to prevent the latter from unwinding before the right moment. The glider is then ready for launching in the catapult.

By adjusting the wings, tail, and balance weights provided, varying results in the glider's performance may be obtained.

These ingenious gliders can be obtained from most of the big London stores, "toy bazaars," etc., or direct from the distributing agents, Messrs. The Almor Trading Co., 68, New Oxford Street, W.C. 1.



THE "OLYMPIC" MODEL GLIDER: This glider, with its wings folded, is shot high into the air by a catapult, as shown above on the left. The shock of catapulting releases a short elastic motor, which after it has unwound, frees the wings. These open and the model glides to earth.

By DOUGLAS B. ARMSTRONG

Rarest Air Stamp

THERE is a new, or rather an unsuspected, claimant to the proud position of the rarest air stamp, one of the three known examples of which we are enabled to illustrate. It appears that on the eve of the transatlantic flight of 1919,

Scarce air-post cover carried by British dirigible "R.34." A similar example sold for £35 at a recent London auction.

Hon. J. A. R. Robinson, then Postmaster-General of Newfoundland, addressed a few words of greeting to personal friends in England, sending one or more letters by each of the competing 'planes. Across the stamp he wrote, in each instance, the words "Aerial Atlantic Mail," and added his

RAREST AIR STAMP KNOWN : Only three stamps with the personal inscription of the Postmaster-General of Newfoundland (as above) are believed to exist.

own initials as a guarantee of authenticity. Only three of these rare manuscript provisionals have come to light so far, and it is believed that no more exist. The copy illustrated is that entrusted to the ill-fated Martinsyde machine "Raymor." Its philatelic value is probably in excess of £100.

Readers are invited to forward to the Editor of FLIGHT *letters, etc., bearing aerial stamps or postmarks for mention in this column, as well as out-of-the-way varieties, etc.*

We shall also be pleased to hear from correspondents interested in air-stamp collecting, and to answer any queries.

PUBLICATIONS RECEIVED

Aeronautical Research Committee. Reports and Memoranda:

No. 802 (Ae. 56). Experiments on Models of a Rigid Airship of New Design. By R. Jones, D. H. Williams and A. H. Bell. June, 1922. Price 1*s.* 3*d.*

No. 806 (Ae. 59). On the Theory of Tapered Aerofoils. By A. Fage. January, 1923. Price 1*s.*

No. 814 (Ae. 65). Experiments on Rigid Airship R.32. Part IV.—Note on Measurements of Airscrew Thrust. By R. A. Frazer and H. Bateman. September, 1922. Price 6*d.*

No 821 (Ae. 72). On Castiglian's Theorem of Least Work and the Principle of St. Venant. By R. V. Southwell. May, 1922. Price 9½*d.*, post free.

No. 823: Description of Lift, Vertical-force and Drag Balances for the Roof of the Duplex Wind Tunnel. By T. H. Fewster. (October, 1922.) London: H.M. Stationery Office. Price 9*d.* net.—No. 827: The Prediction of the Resistance of Rigid Airship R.33. By R. A. Frazer, B.A., B.Sc., and A. G. Gadd. (July, 1922.) London: H.M. Stationery Office. Price 1*s.* 3*d.* net.—No. 828: A Continuous Rotation Balance for the Measurement of Lp at Small Rates of Roll. By E. F. Relf, A.R.C.Sc., and T. Lavender. (August, 1922.) London: H.M. Stationery Office. Price 4*d.* net.—No. 835: Tests of Four Slotted Aerofoils, supplied by Messrs. Handley Page, Ltd. By F. B. Bradfield, of the Royal Aircraft Establishment. Presented by the Director of Research. (September, 1922.) London: H.M. Stationery Office. Price 9*d.* net.

No. 824 (Ae. 75). A Method of Calculating the Characteristics of a Tapered Wing. By H. Glauert. October, 1922. Price 4½*d.*, post free.

No. 825 (Ae. 76). The Singing of Circular and Streamline Wires. By E. R. Relf and E. Ower. March, 1921. Price 3½*d.*, post free.

No. 826 (Ae. 77). An Investigation of the Influence of Downwash on the Rotary R Derivative M[. By L. F. G. Simmons and E. Ower. June, 1921. Price 6*d.* net.

No. 833 (Ae. 83). The Design of Tapered Wings. By W. S. Farren. July, 1922. London: H.M. Stationery Office, Kingsway, W.C. 2. Price 1*s.* 0½*d.*, post free.

No. 834 (Ae. 84). The Handley Page Slotted Wing. By H. Glauert. March, 1922. Price 6½*d.*, post free.

No. 836 (Ae. 86). The Manœuvres of Inverted Flight. By Squadron Leader R. M. Hill, M.C. September, 1922. Price 1*s.* 7*d.*, post free. London: H.M. Stationery Office, Kingsway, W.C.

No. 837 (Ae. 87). An Empirical Method of Predicting the Aero-Dynamic Properties of an Aerofoil. By Alexander Thom. December, 1921. Price 1*s.* net.

⁂ ⁂ ⁂ ⁂

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AERONAUTICAL PATENT SPECIFICATIONS

Abbreviations: cyl. = cylinder; I.C. = internal combustion; m. = motor
The numbers in brackets are those under which the Specifications will be printed and abridged, etc.

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